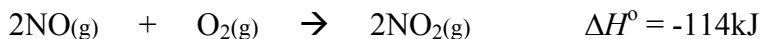


AP Exam Q6 2002 (Form B) (no calculator)

Using principles of chemical bonding and molecular geometry, explain each of the following observations. Lewis electron-dot diagrams and sketches of molecules may be helpful as part of your explanations. For each observation, your answer must include references to **both** substances.

- The bonds in the nitrite ion are shorter than the bonds in the nitrate ion.
- The CH_2F_2 molecule is polar, whereas the CF_4 molecule is not.
- The atoms in C_2H_4 molecule are located in a single plane, whereas those in a C_2H_6 molecule are not.
- The shape of a PF_5 molecule differs from that of an IF_5 molecule.
- HClO_3 is a stronger acid than HClO .

2001 Q 2 part d (calculator allowed)



Use the data table below to calculate the bond energy, in kJ mol^{-1} , of the nitrogen-oxygen bond in NO_2 . Assume that the bonds in the NO_2 molecule are equivalent. (i.e., they have the same energy).

	Bond Energy (kJ mol^{-1})
Nitrogen-oxygen bond in NO	607
Oxygen-oxygen bond in O_2	495
Nitrogen-oxygen bond in NO_2	?